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METHODS FOR CONDUCTING LIFE-HISTORY STUDIES ON TARSONEMID MITES

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Insect Investigations

In previous investigations on the life history of the tarsonemid mites, workers employed various cells containing bits of host leaf tissue as food and places for egg deposition. In the present study, cells patterned after the earlier ones as well as other types have proved unsatisfactory. The relative humidity was difficult to control; if too low, the leaf tissue dried, or, if too high, moisture condensed and the mites became enveloped and drowned. It was also apparent that the detached leaf tissue underwent rapid changes in the cell which decreased its attractiveness to the mites and resulted in their wandering about and in their loss or escape. Probably the paucity of actual records resulting from previous life-history studies of mites is due to these same difficulties.

In the present investigation the broad mite (Tarsonemus latus Banks) was readily confined to a given leaf on a plant by a barrier on the petiole made as follows (fig. 1): A small wisp of twisted cotton is wrapped about the petiole and tied with a loop of thread, and a narrow band of tanglefoot is placed on the cotton near the upper margin. Tanglefoot placed directly on the petiole kills the tissue, and the leaf droops prematurely. The tanglefoot apparently repels the mites, since they will cross the cotton barrier in the absence of the former but avoid it when present. In order to facilitate the search for the mites on a given leaf, the area is greatly reduced by cutting off the edges. The leaves are numbered by cutting notches in the margin, so that several leaves on a plant may be used. Each egg laid during a given period on each leaf is located under the microscope and marked by a needle prick in the nearby leaf tissue so that it may be observed later for hatching. The locations of quiescent larvae are similarly marked. Mites are transferred by a small needle and brush described in ET-67.

Unlike the broad mite, which feeds on fully exposed leaf areas, the cyclamen mite (T. pallidus Banks) prefers to feed and oviposit on tender tissue in crevices. This condition is supplied by using the above-described set-up to confine them to a given leaf, then forming a crevice by folding under a tip of the leaf and holding it in place by means of a small "pinch-on" paper clip. A more favorable arrangement is to confine the cyclamen mite to the tip growth of such plants as verbena by a barrier, then holding the clasping terminal leaves together with a clip to furnish protection.

Suitable hosts for this work include pepper plants for the broad mite and delphinium or verbena for the cyclamen mite. Plants should be small and in 2-inch or smaller pots to permit handling under the microscope. Several hundred rearing records have been obtained by these methods which have indicated their value as a laboratory procedure. The experimental mites are also under more natural conditions on the growing plant than in previously used methods.



Figure 1.--Barriers on petioles to confine mites to leaves and tips bent under and held in place with clips to form dark crevices. Leaf area not reduced and margins not notched on this plant.

